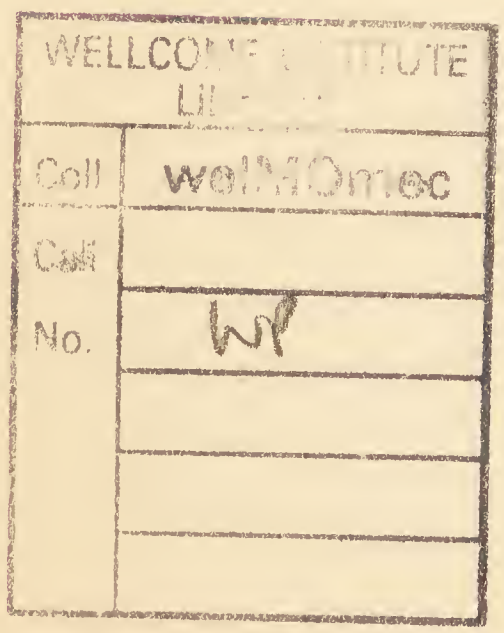
A REVIEW OF 658 OVARIOTOMIES

BY

HERBERT R. SPENCER



A REVIEW OF 658 OVARIOTOMIES.

By Herbert R. Spencer, M.D.

The term "ovariotomy" in this communication means the removal of an ovarian or parovarian tumour, including the excision of a tumour from the ovary, with the retention of the rest of the organ: it does not include the removal of normal or small cystic ovaries, and the lower limit of the size of a "tumour" is that of a hen's egg. I hold the opinion that complete records of cases of operation are of much greater value than selected series, and that records made by the actual operator may be more valuable than those made by extraneous writers who have no personal knowledge of the cases. Nearly forty years ago—in December 1893—I read a paper on my first fifty ovariotomies, giving details of each case and of the other abdominal sections which I had performed up to that date [1]. I would have liked to publish similarly the rest of my cases, did time and space allow. The present review could not have been made in the time at my disposal had I not made a record, in a large note-book ruled for analysis, of the main features of each case immediately after the operation and recovery or death. I strongly advise young gynæcologists to have such a note-book as a ready means of keeping in touch with their operative work.

Ovariotomy is looked on by some as a simple and easy operation: it is in fact a more dangerous and difficult operation than hysterectomy for myoma, mainly because of the adhesions and complications which often accompany it and because of the frequent malignancy of the tumour.

All the cases have been operated on by myself, and no patient who recovered has been discharged from the hospital or nursing home before the twenty-fourth day after operation.

Statistics rarely state how long the patients remain under observation after operation; patients early discharged may be recorded as "recovered" although some may have succumbed to sequelæ, such as embolism or intestinal obstruction, in the third or fourth week.

All the tumours have been examined, macroscopically and microscopically, by myself, mostly in association with my friend T. W. P. Lawrence, a few also with my lamented friend, the late Professor Shattock.

I have not divided the cystic tumours into unilocular and multilocular, or into pseudomucinous and serous, but have considered separately the tumours containing papilloma, which gives them their chief clinical importance.

Although many of the tumours were very large, none of them reached the gigantic size of those reported to have weighed 200 and even 300 pounds. One parovarian cyst contained 3 gallons of fluid—a mere pigmy in comparison with Targett's, which held 9 gallons. One ovarian fibroma (cystic) weighed 45 pounds.

The ovariotomies were bilateral in 164 cases, on the right side in 250, on the left side in 238; in six cases the side is not given. In some of the unilateral cases the other ovary had been or was subsequently removed for a similar or different growth (in one instance after twenty-five years, v. *postea*). In one case, fifteen years after the bilateral ovariotomy, an inoperable cancer of the cervix was found.

Association with Pregnancy.

Sixty-three of the tumours—nearly one-tenth—complicated pregnancy, labour or the puerperium, and twenty-three were operated on during pregnancy or labour. These sixty-three cases have been published in detail, with remarks on ovarian and parovarian cysts complicating pregnancy [2].

I would here only emphasize the inferiority of Cæsarean section to simple ovariotomy in the treatment of ovarian tumours in advanced pregnancy and labour and its superiority in the case of *parovarian* tumours in advanced pregnancy, owing to the risk of thrombosis and embolism (loc. cit., *Brit. Med. Journ.*).

The superiority of ovariotomy over Cæsarean section in the case of an ovarian cyst incarcerated in the pelvis during labour and incapable of being pushed up into the abdomen, is well illustrated by the photograph (exhibited) sent to me unsolicited by the patient in 1924, twenty-seven years after I had operated on her during labour by ovariotomy followed by forceps, while the uterus was lying on the abdominal wall (*Trans. Obst. Soc.*, Lond., 1898, xl, 14). The photograph shows the patient and her husband and nine living children (of the ten she had had since the operation).

Ages of the Patients.

Total	Age given in	Age 10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
658 (all cases)	645	19	136	183	138	113	45	10	1
45 (parovarian)	44	2	13	19	10	0	0	0	0
66 (dermoids)	65	2	20	25	9	7	2	0	0
20 (fibroma or adenofibroma)	20	0	3	1	6	3	4	3	0
67 (malignant)	63	2	3	6	17	27	8	0	0

The youngest patient was aged 14, the eldest 82. Eleven were over 70 years of age. I have published these eleven cases [3] in detail, with some remarks on ovariotomy in the aged.

Fertility.

My records are not quite complete as to the married or single state of the patients. At least 150 of the patients were single, the youngest being 14 years old. Of the married women, at least 304 had had one or more children; eighteen of them had ten or more, and one had had 18 children. The mother of this large family, who had also had a miscarriage, was operated on for an enormous ovarian multilocular cyst at the age of 67; it probably developed after the menopause.

Adhesions.

Adhesions were present in 448 out of the 658 ovariotomies, i.e., in over two-thirds of the whole number.

The most frequent of the adhesions were to the abdominal wall and omentum. The most important were those to the bladder (which was opened in two cases); to the peritoneum of the pelvic cavity (leading to the exposure of the ureters in three cases and to fistula and the subsequent sacrifice of the kidney in one); to the uterus (sometimes removed on account of the dense adhesions but more often on account of concomitant disease); to the small intestine (necessitating enterectomy in three cases); and to the large intestine and especially the sigmoid and pelvic colon (for which enterectomy was performed in three cases, in addition to two cases in which the hole in the bowel communicating with the cyst was closed by suture).

Torsion of the Pedicle.

In 85 of the 658 ovariotomies the pedicle of the tumour was twisted (11·3%).

In one case the torsion had completely severed the pedicle, so that the tumour was parasitic on the adherent omentum.

In 57 the tumour was a cystadenoma, in one a solid cancer, in 18 a dermoid, in one a fibroma, in nine a parovarian. One tumour, removed within two hours of the occurrence of the torsion, showed extensive hæmorrhage into the tissues of the tube and broad ligament; two cases of parovarian cyst showed great congestion of the ovary, but not the cyst [4] ; another showed great stretching and thinning of the tubal epithelium by the effused blood [5].

Ovarian Tumours Tapped before Operation.

Twelve tumours had been tapped before operation, six in my first fifty cases, six in the remaining 608; only one (an enormous multilocular cyst) has been tapped by me, to relieve the embarrassed breathing before the operation. The tapping was followed, in every case but one, by adhesions, in one case by suppuration. Except in very rare circumstances, tapping should have no place in modern practice.

Ovarian Tumours Ruptured before Operation.

Forty-one tumours were ruptured before operation. Seven of these were malignant—in two cases solid medullary cancer. The rest were cysts, of which one was a dermoid ruptured during riding exercise: two were cystic fibromata; one (a pseudomyxoma ovarii) had been treated abroad by massage for abdominal fat; four operations were performed on this patient, two for ovarian pseudomyxoma and two for pseudomyxoma peritonei, with growths in the omentum and colon; she recovered well from the operations and died from heart disease seventeen years after the first ovariotomy. Two of the patients had been treated for ascites. In one case the rupture had completely healed, without producing adhesions.

Papillomatous Ovarian Cysts.

Thirty-three benign ovarian cysts contained papilloma inside and, in some cases, outside the cyst; in addition seventeen malignant cysts were "papillomatous."

Of the thirty-three benign cases the papillomatous cyst was on the right side in 12, on the left side in 10, and the affected ovary only was removed; in 11 cases both ovaries were papillomatous and were removed, or (in three cases) the other ovary had been removed at a previous operation.

In one case in which the left ovarian tumour (ruptured), of the size of a fist, had papilloma inside and on the surface, the patient was in excellent health twenty-four years after the operation, although the affected ovary only was removed. Another patient, from whom a small unruptured papillomatous cyst was removed, together with the myomatous uterus (the other ovary being retained), remained well twenty-eight years later.

In another case, in which there were bilateral tumours of the size of coconuts, with papillomatous masses inside and outside, an exploratory operation had been carried out by an experienced gynæcologist, who, after excising a piece of the growth, declared it to be malignant and inoperable. Both tumours were removed and, four years later, a mass of papilloma was dissected off the broad ligament, and the patient was in good health twenty years after the ovariotomy.

Papilloma in parovarian tumours is mentioned later.

Dermoid Tumours.

Of the 66 patients in whom dermoids occurred, the youngest was aged 18, the oldest 67, only two being over 60. Nineteen of the patients were single. Of the married women 11 had had no child. One primigravida was delivered by Cæsarean section; in four it is not stated whether there were children or not; 30 patients had had in all 105 children (an average of 3·5), but only 12 abortions in all. The

largest family (10 children and two abortions) occurred in a patient aged 42, who had a dermoid tumour as large as the pregnant uterus at six months, containing a large number of fat balls; these were present also in another very large dermoid, of the size of the uterus at term, in a woman aged 64. Thirteen of the tumours were bilateral, 32 on the right side, 21 on the left; one tumour independent of the ovaries, was contained in the broad ligament, a so-called parovarian dermoid. Three of the tumours were large multilocular pseudomucinous cysts with a dermoid loculus; one of these was ruptured and discharged twelve pints of gelatinous fluid into the peritoneum. One tumour was an endothelioma with a dermoid loculus, and one a sarcomatous dermoid [6].

Thirty-four of the tumours were adherent; 32 were free from adhesions.

The pedicle was twisted in 18 of the 66 cases (27·2%); in one the pedicle was completely divided, in another almost so. Four of the tumours were suppurating, the infection coming apparently from the adherent intestine: in one of these colitis was present, in the other the temperature was 103° F. at the time of the operation. In a third patient the tumour communicated with the pelvic colon. In a fourth the infection was caused by tapping (10 pints) and leaving the trocar in for three weeks. In one patient, recovering from typhoid, the temperature was 102° F. at the time of operation, but the tumour was not suppurating.

The tumours contained the usual sebaceous fluid and various embryonic structures and—in every case but one—hair; that tumour contained bone, teeth, and thyroid.

Particulars concerning the 15 dermoids complicating pregnancy, labour and the puerperium have been already published [2]. There seems to be some evidence that dermoids, like certain uterine myomata, diminish or retard fertility. One of the patients had had three children and one miscarriage by the time she was 30, but no subsequent pregnancy seven years later, when bilateral dermoids were removed. Another very healthy woman, very anxious for children, was sterile for five years, when a dermoid as big as a coconut was removed, and a cystic ovary left behind. Eight months later she became pregnant and was delivered of a living girl, and afterwards of a boy. A few months afterwards she developed cancer of the cervix, for which perhaps I have the responsibility, having left that cystic ovary. Radium and Wertheim's hysterectomy were successively and successfully employed, for I saw the patient recently in perfect health (with sexual passion unimpaired) more than twelve years after the hysterectomy.

With regard to the operation, in all cases but one the whole ovary was removed; in that case the tumour was excised and the remains of the ovary stitched over, a practice which I think should be more common in these cases.

Ovarian Fibroids.

There were 20 of these (18 fibroma, two adenofibroma). Three of these tumours occurred in patients over 70 years of age, the oldest being 77 (adenofibroma). Two of the 20 patients were single; three of the 18 married ones had not been pregnant; the remaining 15 had had in all 65 children (average 4·3) and 17 abortions (average 1·1). One patient, aged 62, had had 11 children and four abortions; the tumour in her case was an adenofibroma of the size of a filbert, accompanied by an enormous multilocular cyst (ruptured) on the other side [14].

Ten of the tumours were on the right side, seven on the left, two on both sides; in one case the side is not stated.

In 13 there were no adhesions; in one case only was the pedicle twisted. Six of the tumours were cystic, of these two were ruptured; one, unruptured, weighed over 45 lb.

Two tumours (one infected) were removed after abortion, and one (calcified) impacted in the pelvis, was removed immediately after Cæsarean section.

In one of the bilateral cases a large fibromatous ovary was removed and a small fibroma enucleated from the other ovary in early pregnancy; the patient aborted, but subsequently had a child.

In addition to the effusion from the two ruptured tumours, free fluid was found to the extent of from half a pint to three or more pints in five of the remaining 16 fibromata (31·2%). In one case, in which there was no free fluid, the veins of the adherent omentum were very large; in another the lymphatics were greatly distended.

Besides these 20 cases of ovarian fibromatous tumours three cysts (one multilocular and two unilocular) [14] had a small fibromatous nodule in the cyst wall.

Parovarian Tumours.

There were 45 parovarian tumours, 19 occurring in single patients, 26 in married women who had had in all 36 children: the small number of children may be accounted for partly by their ages (q.v. *ante*). Twenty-five of the tumours occurred on the right side, 20 on the left. Adhesions were present in 19 cases, torsion of the pedicle in 10. The cysts were unilocular except in one (bilocular) and contained clear watery fluid, except in one which was suppurating owing to a communication with the colon. Minute papillomata were not infrequent, but only three had a mass as big as a grape. One parovarian tumour, of the size of a small coconut, was stuffed solid with papilloma—a very rare condition, so far as I know. In this, as in most of the cases, the corresponding ovary was spared; in some, in which it was inflamed as a result of torsion (*vide ante*), it was removed.

The eight cases complicating pregnancy have been published in detail, with remarks [7].

Suppurating Tumours.

There were 58 suppurating tumours, 16 occurring on the right side, 16 on the left side, 18 on both sides; in three the side is not noted. One was a parovarian communicating with the descending colon; its removal was followed by a temporary fæcal fistula, which also occurred after the removal of a suppurating papillomatous cyst. Fifty-three were ovarian cysts, of which eight were infected after labour. Some of the tumours were very large, one containing 20 pints of pus. Four of the tumours were dermoids. Two were malignant papillomatous and one a cancerous cyst. One cyst was tubercular. In four cases the cyst was infected from the adherent appendix, which was removed: in one the tumour communicated with a loop of small intestine, which with the appendix was removed [8]. Six tumours were infected through the tubes. In four cases the tumours were luteal abscesses.

In six cases hysterectomy was performed; in two others a cornu of the uterus was excised; in one for an abscess, in the other on account of inseparable adhesions: in the latter case the patient subsequently had two children. All the suppurating tumours were adherent.

Drainage was used in 29 of the cases. Five of the patients died (9·4%).

Malignant Tumours.

There were 67 malignant tumours, of which 66 were malignant ovarian tumours, and one a benign unilocular cyst, with cancer of the body of the uterus; 58 of the 66 were carcinomata, six sarcomata, and two endotheliomata. All the parovarian tumours were benign.

The carcinomata were either solid—in two cases of which (ruptured medullary cancer) the patients remained well six and seven years after removal, the latter having since had two children [9]—or adenocarcinoma, of which one (cystic and

ruptured) recurred in the fat of the abdominal wall, the patient remaining well five years after the ovariotomy and three years after the removal of the metastasis—or papillary carcinoma, or malignant papilloma.

Two cases were complicated by cancer of the cervix, one of these recurred after a year, the other just over three years after the ovariotomy and hysterectomy.

One case (a benign unilocular cyst) had also cancer of the body of the uterus; the patient remained well twenty-four years after the removal of uterus and ovaries. Two cases had also cancer of the Fallopian tube; their after-history is unknown.

Two cases had also cancer of the breast. Of these one had had a pseudo-mucinous cyst removed by Sir John Williams nearly twenty-five years previously. In May, 1915, when the patient was aged 46, I removed a carcinomatous (spheroidal-cell) ovarian tumour of the right side. In February, 1921, Mr. Raymond Johnson removed the right breast for cancer; three months later there were signs of recurrence in the glands.

In the other case I had removed a papillomatous ovarian tumour of the right side five years previously. On March 27, 1920, when the patient was 68 years old, I removed the other ovary (which contained a malignant papillomatous tumour) together with 22 inches of densely adherent small intestine. The cancerous breast was removed by Mr. Raymond Johnson five weeks later, and the patient remained well in April, 1924.

Of the six cases of sarcomata one, occurring in a dermoid, has already been published in the *Proceedings* [10]; the sarcoma was a large round-cell growth. Three were spindle-cell sarcomata, one weighing 11 lb.; two fibrosarcomata. One of these had been diagnosed, no doubt accurately, by a distinguished gynæcologist as an ovarian fibroma complicated by uterine myoma, and had been treated by X-rays, with complete success as regards the cessation of bleeding. After about five years the ovarian tumour rapidly grew and, at the operation of total hysterectomy, was found to be very adherent and vascular and to have become sarcomatous. The further history of the case is not known.

The sixth case was a fibrosarcoma, developed (as in one of the cases of carcinoma) in an ovary left at a total hysterectomy for myoma eleven years before, already published by this Society [11]. It recurred, but the growth of the metastases was checked for about three years by X-rays.

Of the two endotheliomata one occurred in a dermoid, recurred in the vagina after thirteen years [12] and again later; the other occurred in a woman aged 59, the mother of six children, who remains well after ten years.

Adhesions were present in 55 out of the 67 malignant tumours. In only one case was the pedicle twisted. Drainage was employed in 18 cases. Seven of the 67 patients died (10·4%).

The frequency of malignancy in this series, even after excluding the parovarian tumours, is just over 10%; or, if six exploratory operations for inoperable cases of ovarian carcinoma (of which three died) be added, under 11%.

I am of the opinion that the high frequency of malignancy in ovarian tumours often stated in important treatises, viz. 20 to 25%, is exaggerated, and that the error is due to mistaking benign for malignant papilloma and fibroma for sarcoma.

I have personally removed eleven papillomatous ovarian tumours which had been declared, after cœliotomy, to be inoperable and mostly malignant, by experienced gynæcologists (of whom, I hasten to say, I was one). In only one of these cases did the tumours show definite microscopic evidence of malignancy, and in that case the patient survived the removal of the tumour for four years.

With regard to the frequency of sarcoma (in this series six in 658 ovariotomies, or under 1%), it has been known since the days of Virchow to be a very rare tumour in the ovary and is, I believe, whether in that organ or in the uterus, extremely malignant, yet, in A. Mayer's Tübingen statistics [13], collected by assistants,

amongst 682 cases there were 22 sarcomata (3·2%), of which 12 were stated to be spindle-cell sarcoma. The percentage of cures (Dauerheilung) in those 22 cases is given as 66·7% and, after unilateral ovariotomy, as 62·5%.

Mortality.

The total number of patients who died after operation while in hospital or nursing home was 35 (5·3%). All patients remained in bed for twenty-one days and were not discharged before the twenty-fourth day after operation. Two of the patients who were about to leave the hospital (one a case of parovarian cyst, the other a case of malignant cyst with secondary growths in the peritoneum) died suddenly from pulmonary embolism on the twenty-fourth day; two patients with malignant tumours, while still in the hospital and nursing home, died from cachexia, one thirty-four days and the other five months after the operation. Another patient, very obese, from whom a large multilocular cyst had been removed, died suddenly from syncope, apparently due to a fatty heart, on the twenty-second day. One died suddenly while under the anæsthetic (ether). Six of the tumours were suppurating, two of these being dermoids. One was a case of bilateral ovarian fibromata removed with the uterus; extensive cancer of the stomach was found post mortem. A case of large adenofibroma in a patient aged 77 has been published in the *Proceedings* [14]. Seven of the cases were malignant, six of these being cancerous with secondary growths elsewhere; one was a large sarcoma weighing 7 lb. Two of the patients were operated on as emergency cases suffering from obstruction and stercoraceous vomiting, and in an almost hopeless condition; three while suffering from bronchitis, from which they died; one patient who had a large gangrenous cyst, and peritonitis and high fever at the time of operation, died of septic endocarditis and abscesses in the lungs on the fifteenth day. One died from cerebral and spinal hæmorrhage on the second day; one from intestinal hæmorrhage (ulcerative colitis) on the eighth day. Four died from shock. In seven of the 35 cases hysterectomy also was performed, in two sigmoidectomy. One patient died from obstruction owing to adhesion of intestine to the pedicle (after operation on the eighteenth day for its relief); one from peritonitis on the sixth day after operation, from adhesion to gauze inadvertently left in the abdomen (removed on the third day). With this sad case, which affected me more than all the successful ones, I close my review. I hope that other gynæcologists when they retire from practice will furnish the Society with a detailed record of all their cases, so that more trustworthy statistics may be forthcoming than some of the heterogeneous ones to which I have alluded.

In the past, Spencer-Wells set a good example in publishing accounts of all his operations. His "one thousand ovariotomies," published fifty-one years ago (1882), is the largest personal record, so far as I know. Although his cases were, on the whole, less serious than those now operated on (e.g., only two of his patients were aged over 70, only twelve of the cysts were ruptured, and only three suppurating) his mortality-rate was 23·2%. We, his debtors and successors, with improved technique, have naturally had better results.

In my first 50 ovariotomies the mortality-rate was 2%; but in the whole series it was 5·3%. The increased mortality was partly due to the larger number concerned, and partly to the greater severity of the cases, 12 out of the 35 deaths occurring after the removal of suppurating and malignant tumours.

I will end by stating my opinion, based on experience, that all benign ovarian tumours, however adherent and whether papillomatous or not, can and should be removed. Some of the benign papillomatous tumours closely resemble malignant growths: if a patient with such a tumour, thought to be malignant, is found two years after an exploratory operation to be fairly well, believe, with me, that you have made a mistake, and remove the tumour.

I also advocate the removal of malignant tumours, even in the presence of accessible secondary growths, if the condition of the patient will allow.

The last word has not yet been written on the value of X-rays and radium in curing or checking metastatic growths, but I have seen some encouraging results. If, after removal of the malignant ovarian tumour (and of affected gut, if necessary), some irremovable growth or severe oozing remains, the use of iodoform gauze, removed after ten days, is a valuable means of saving the life of the patient in these otherwise hopeless cases.

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